

**NorCal Engineering**  
Soils and Geotechnical Consultants  
10641 Humbolt Street Los Alamitos, CA 90720  
(562) 799-9469 Fax (562) 799-9459

July 14, 1998

Project Number 5936-96

Boeing Realty Corporation  
4060 Lakewood Boulevard, 6th Floor  
Long Beach, California 90808-1700

Attn: Mr. Johnny Marasco

RE: **Observation and Testing of Backfill Operations** - Proposed  
Harbor Gateway - Located at 1414 W. 190th Street, in the City of  
Los Angeles, California

Dear Mr. Marasco:

Pursuant to your request, this firm has observed and tested backfill operations at the above referenced project. Results of the compaction tests are attached and locations of these tests are shown on the accompanying Site Plan. All work was performed in accordance with all present day standards of the Geotechnical Engineering Industry.

**Backfill Operations**

The fill areas consisted of 4 excavations ranging from 40 feet to 50 feet wide by 60 feet to 140 feet long with a maximum depth of 8.5 feet (removed buildings 11, 18, 14, and 15) below ground surface and a trench from a removed fire line 300 feet long by 4 feet deep. The excavations were cleansed of all demolition debris and low density soils to expose competent native soils. The excavation bottoms were observed and approved by this firm prior to placement of fill.

Fill soils placed were compacted to a minimum of 90% of the laboratory standard in lifts not in excess of eight inches in thickness. The maximum depth of fill placed was 8.5 feet. Conventional earthmoving equipment was utilized for compaction control. A water truck provided moisture control. The approximate limits of grading operations are indicated on the attached Site Plan.

### **Field/Laboratory Tests**

The relative compaction was determined by Sand Cone Method (ASTM: D1556-82) and by the Drive Tube Method (ASTM: D2937). The maximum density of the fill soils was obtained by the laboratory standard (ASTM: D 1557-78) with results shown on Table I. Tests were performed a minimum of every 500 cubic yards and every two feet in depth of fill placed. Results of field density tests are presented in Table II. No chemical analysis was performed by NorCal Engineering on the excavations nor the backfill soils.

### **Conclusions**

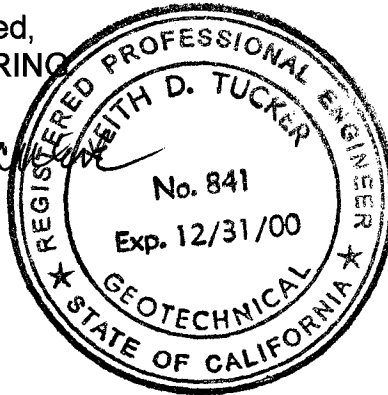
The geotechnical engineering aspects of the backfill operations have been observed and are in compliance with the geotechnical engineer's recommendations. The backfill meets secondary fill requirements for support of pavement and floor slab. The excavations have been backfilled to the approval of this firm and are suitable for their intended use.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,  
NORCAL ENGINEERING

*Keith D. Tucker*

Keith D. Tucker  
Project Engineer  
R.G.E. 841



*Mark Burkholder*

Mark Burkholder  
Project Manager

NorCal Engineering

**TABLE I**  
**MAXIMUM DENSITY TESTS**  
**(ASTM: D1557-78)**

<u>Sample</u>	<u>Classification</u>	<u>Optimum Moisture</u>	<u>Maximum Dry Density (lbs./cu.ft.)</u>
I	Clayey silt	12.0	121.0
II	Silty sandy clay with gravel and concrete pieces	10.5	128.0
III	Clayey silt with gravel and concrete pieces	11.0	125.0
IV	Clayey silty sand	14.0	117.0
V	Silty clay with gravel, brick, concrete	13.0	119.0

**TABLE II**  
**COMPACTION TEST RESULTS**

<u>Date of Test</u>	<u>Test No.</u>	<u>Elevation</u>	<u>Percent Moisture</u>	<u>Unit Wt. lbs./cu.ft.</u>	<u>Relative Compaction</u>	<u>Soil Type</u>
7/2/98	101	6.0-6.5	13.5	114.6	95	I
7/2/98	102	4.0-4.5	11.7	121.6	95	II
7/2/98	103	2.0-2.5	11.4	122.9	96	II
7/2/98	104	9.0-9.5	12.6	113.2	94	I
7/2/98	105	10.0-10.5	13.8	111.3	92	I
7/2/98	106	8.0-8.5	11.0	119.2	93	II
7/2/98	107	6.0-6.5	11.7	118.4	95	III
7/2/98	108	5.0-5.5	11.7	112.4	93	I
7/2/98	109	4.5-5.0	12.6	119.0	95	III
7/6/98	110	3.5-4.0	18.3	105.7	90	IV
7/6/98	111	3.0-3.5	12.2	115.9	93	III
7/6/98	112	2.0-2.5	12.7	114.3	91	III
7/6/98	113	0.5-1.0	13.4	116.5	93	III
7/7/98	114	1.0-1.5	11.3	116.8	91	II
7/7/98	115	3.0-3.5	13.4	115.5	92	III
7/7/98	116	1.0-1.5	11.3	116.8	91	II

\*Depth below finish grade (in feet)

\*\*Retest of failing tests after area reworked

**TABLE II**  
**COMPACTION TEST RESULTS**

<u>Date of Test</u>	<u>Test No.</u>	<u>Elevation</u>	<u>Percent Moisture</u>	<u>Unit Wt. lbs./cu.ft.</u>	<u>Relative Compaction</u>	<u>Soil Type</u>
7/7/98	117	0.5-1.0	10.5	115.8	93	III
7/7/98	118	0.5-1.0	10.7	114.7	92	III
7/8/98	119	7.0-7.5	10.2	113.4	91	III
7/8/98	120	5.0-5.5	11.2	116.0	91	II
7/8/98	121	4.0-4.5	12.0	117.9	94	III
7/8/98	122	3.0-3.5	15.0	111.9	94	V
7/8/98	123	2.0-2.5	12.9	109.8	92	V
7/8/98	124	0.5-1.0	12.6	111.0	93	V
7/9/98	125	4.0-4.5	12.9	111.6	92	I
7/9/98	126	4.0-4.5	13.5	114.5	95	I
7/9/98	127	3.0-3.5	12.7	116.9	94	III
7/9/98	128	2.0-2.5	12.2	115.9	93	III
7/9/98	129	2.0-2.5	12.5	118.7	95	III
7/9/98	130	0.5-1.0	14.2	110.3	93	V

\*Depth below finish grade (in feet)

\*\*Retest of failing tests after area reworked

NorCal Engineering

**NorCal Engineering**  
Soils and Geotechnical Consultants  
10641 Humbolt Street Los Alamitos, CA 90720  
(562)799-9469 FAX (562)799-9459

**CITY OF LOS ANGELES**  
**DEPARTMENT OF BUILDING AND SAFETY**  
**ENGINEER'S CERTIFICATE OF COMPLIANCE FOR COMPACTED EARTH FILLS**

JOB/LEGAL ADDRESS: 1414 W. 190th Street, Los Angeles

SOIL TESTING AGENCY: NorCal Engineering

PROPERTY OWNER'S NAME: Boeing Realty Corporation

OWNER'S ADDRESS: 4060 Lakewood Boulevard, 6th Floor, Long Beach

PER REPORTS ON OUR PROJECT NUMBER: 5936-96

DATE OF WORK STARTED ON PROJECT: 7/2/98

DATE FILL WAS COMPLETED: 7/9/98

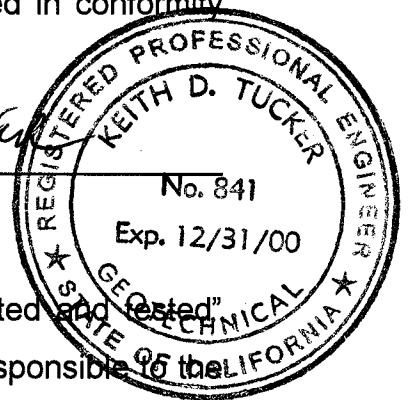
DATE OF THIS CERTIFICATE: 7/14/98

TO THE SUPERINTENDENT OF BUILDING:

I hereby certify that I have personally inspected and tested the placing of compacted earth fill on the above described property, and on the basis of these inspections and tests it is my opinion that the same was placed in conformity with the requirements of the Los Angeles City Building Code.

*Keith D. Tucker*

Keith D. Tucker  
R.G.E. 841



\*For the purpose of this certificate, to have "personally inspected and tested" shall include inspection and testing performed by any person responsible to the licensed engineer signing this certificate. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed thereon.

